

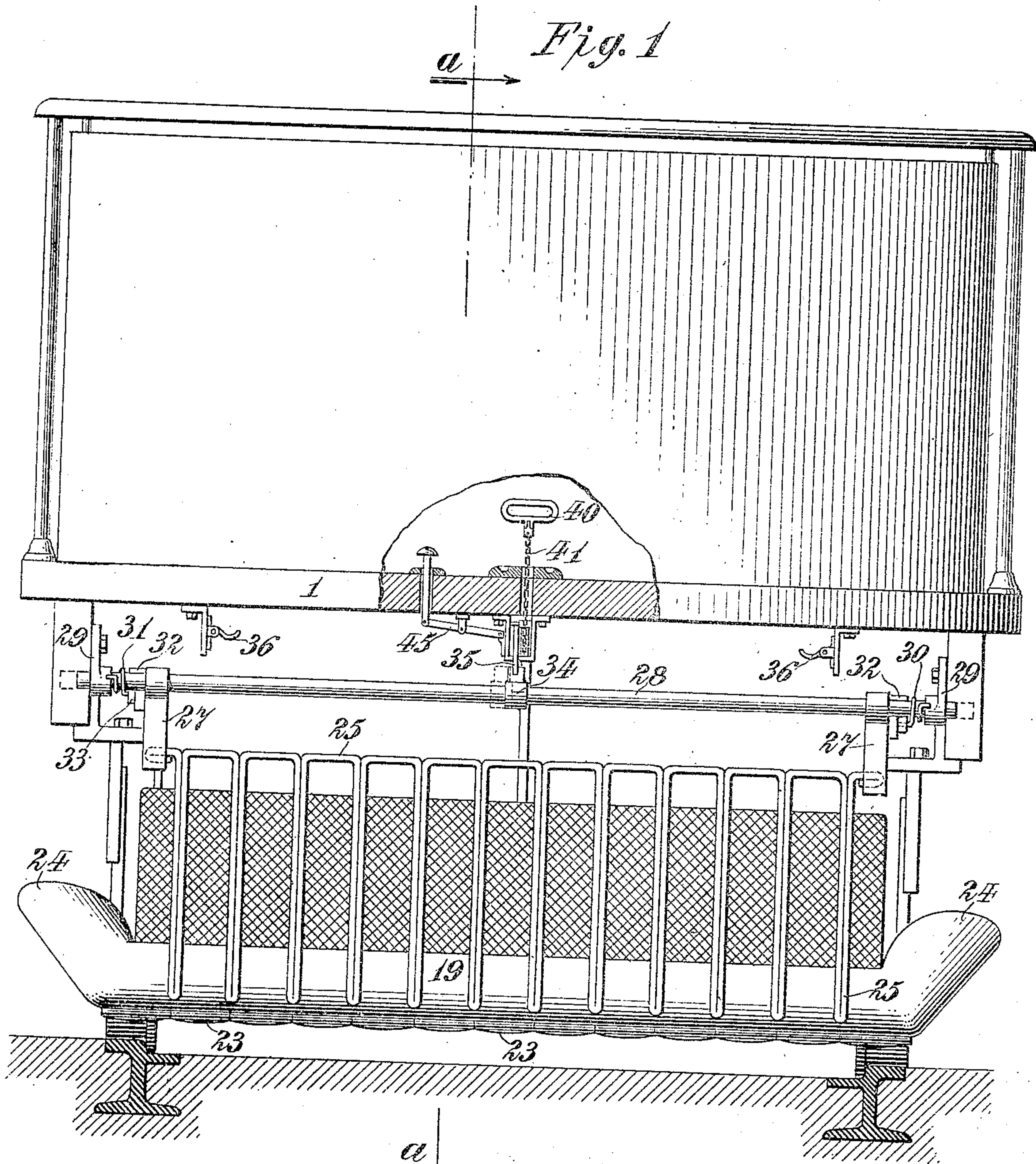
G. HIPWOOD.
FENDER.

APPLICATION FILED AUG. 10, 1908.

946,966.

Patented Jan. 18, 1910.

4 SHEETS—SHEET 1.



Witnesses:
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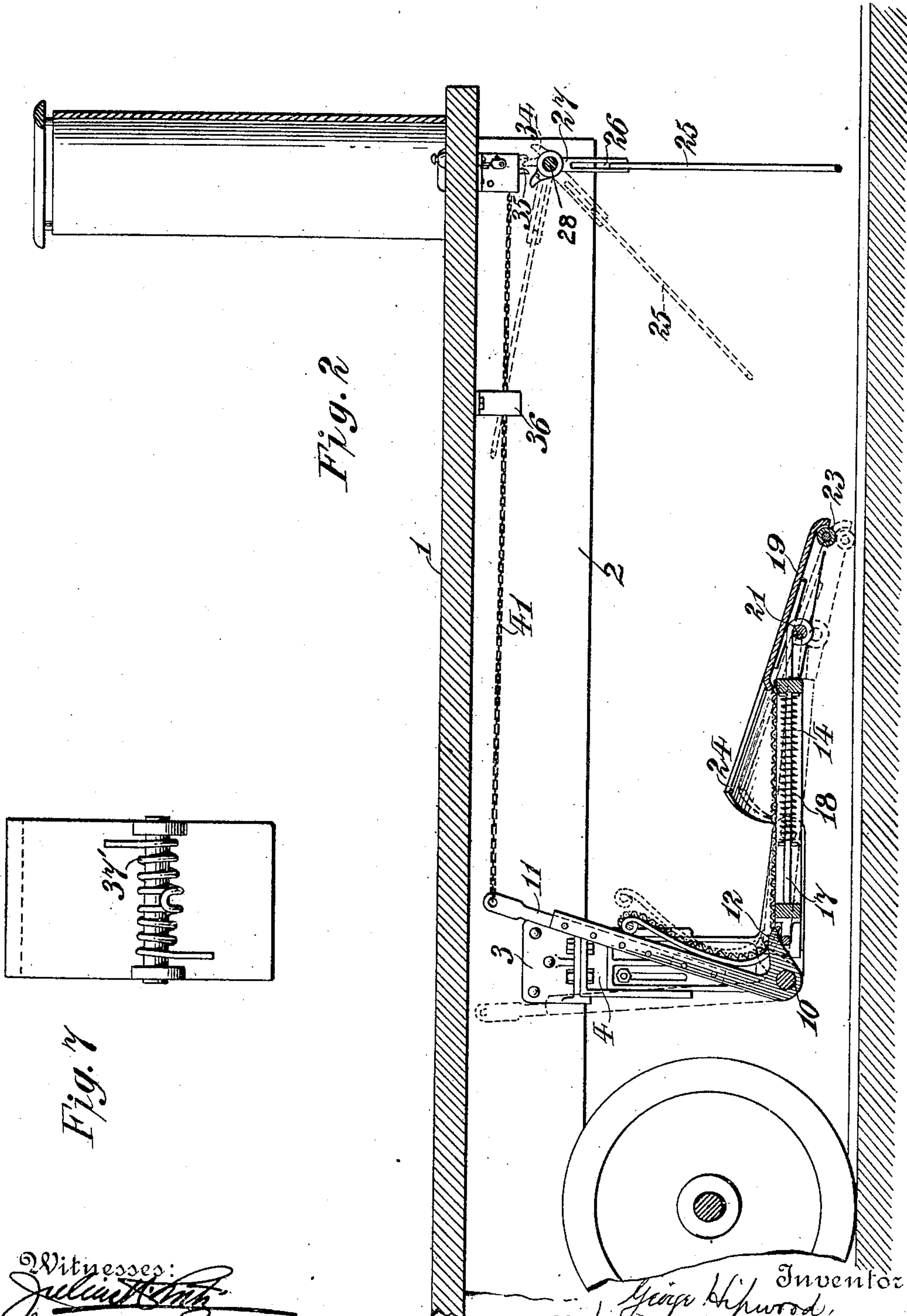
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

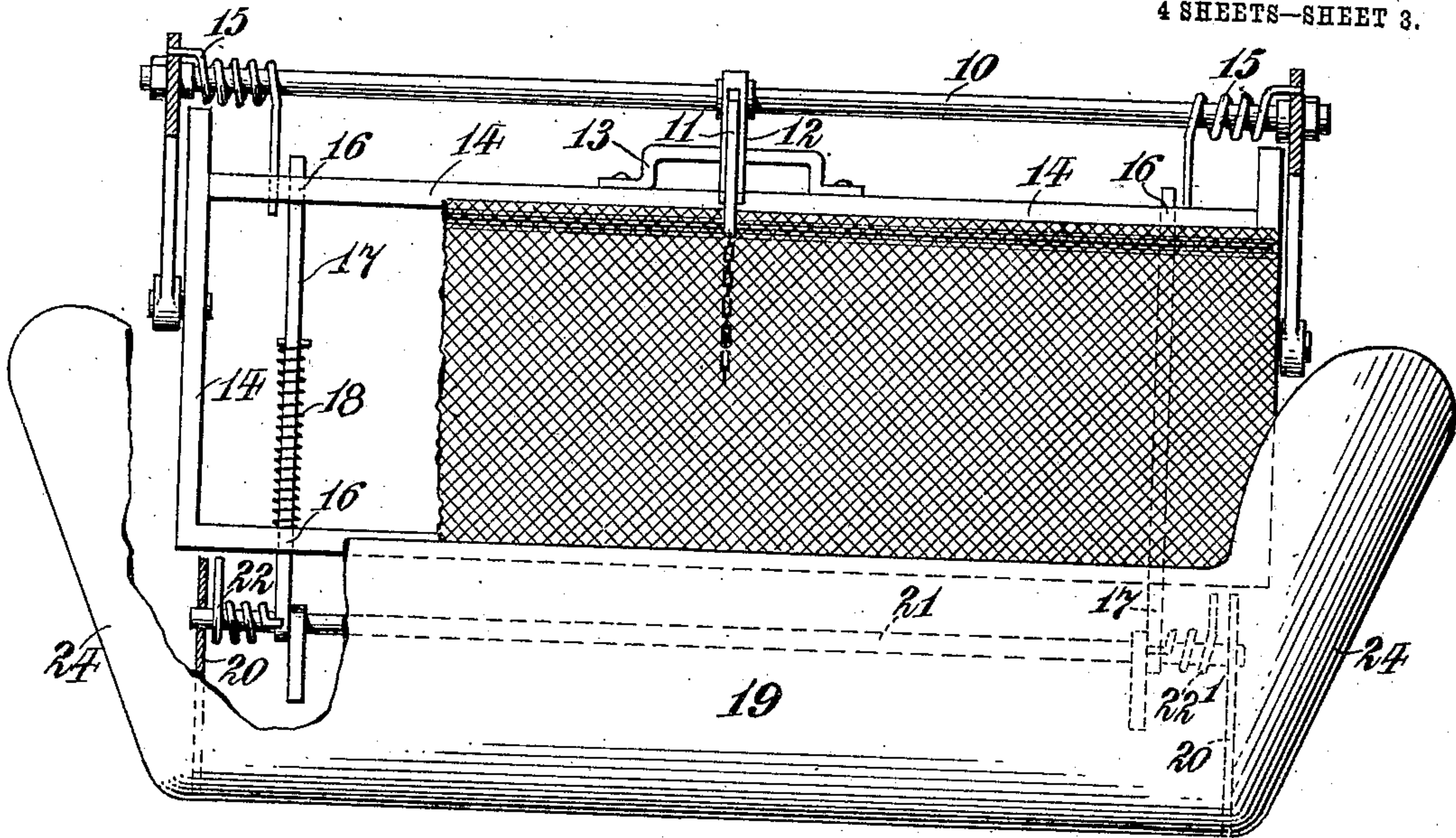


Fig. 3

Fig. 6

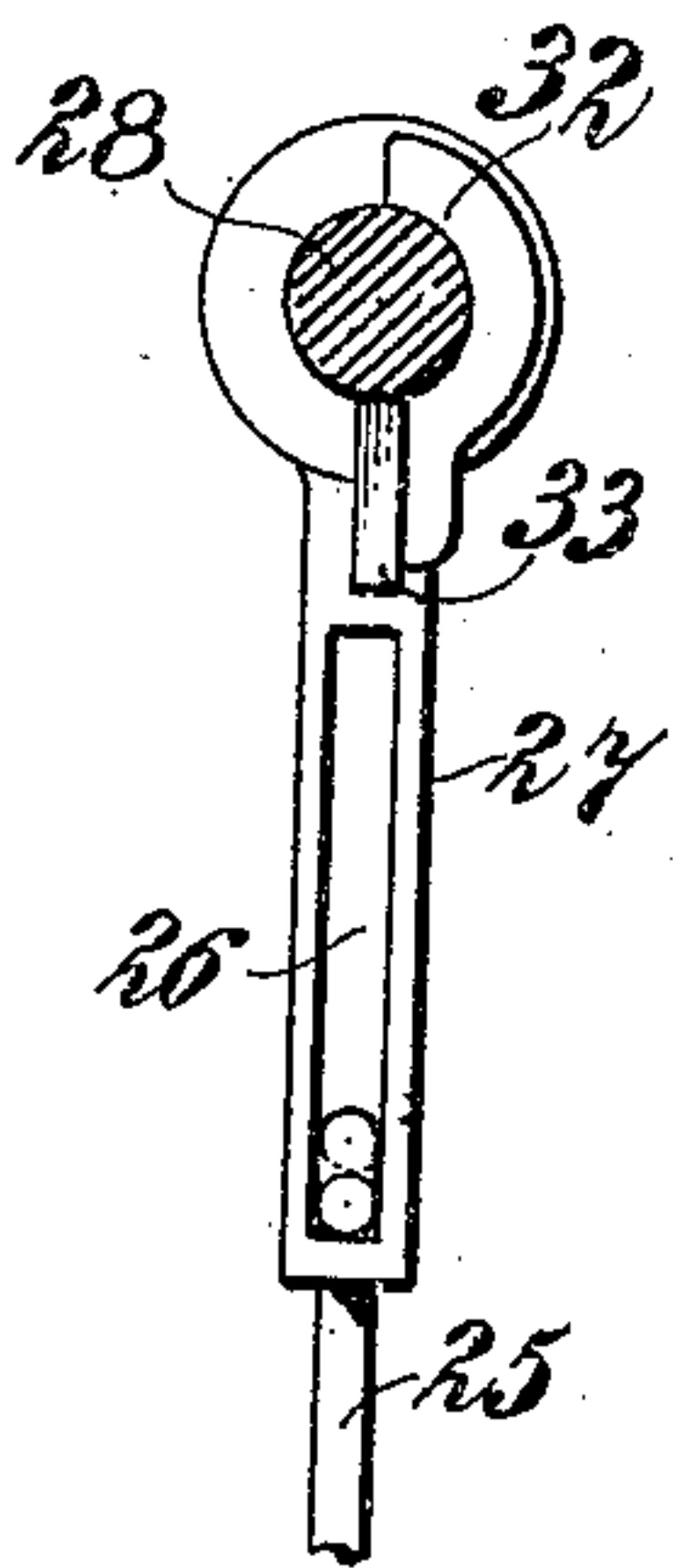


Fig. 4

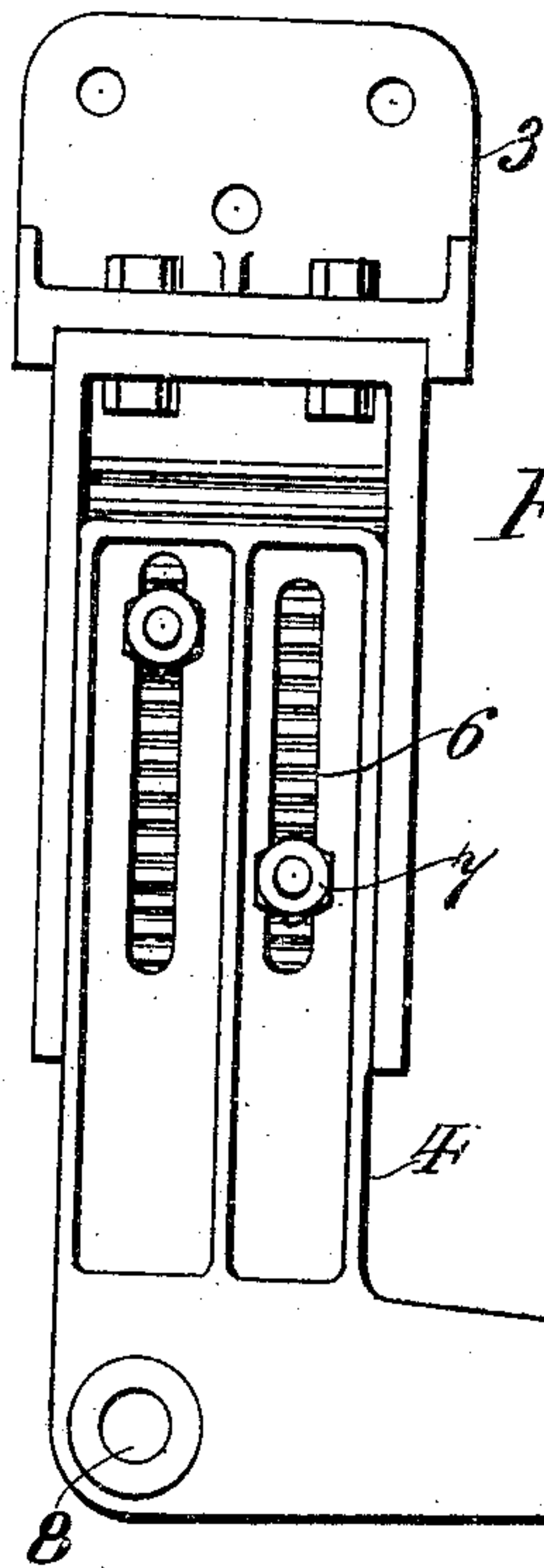


Fig. 5

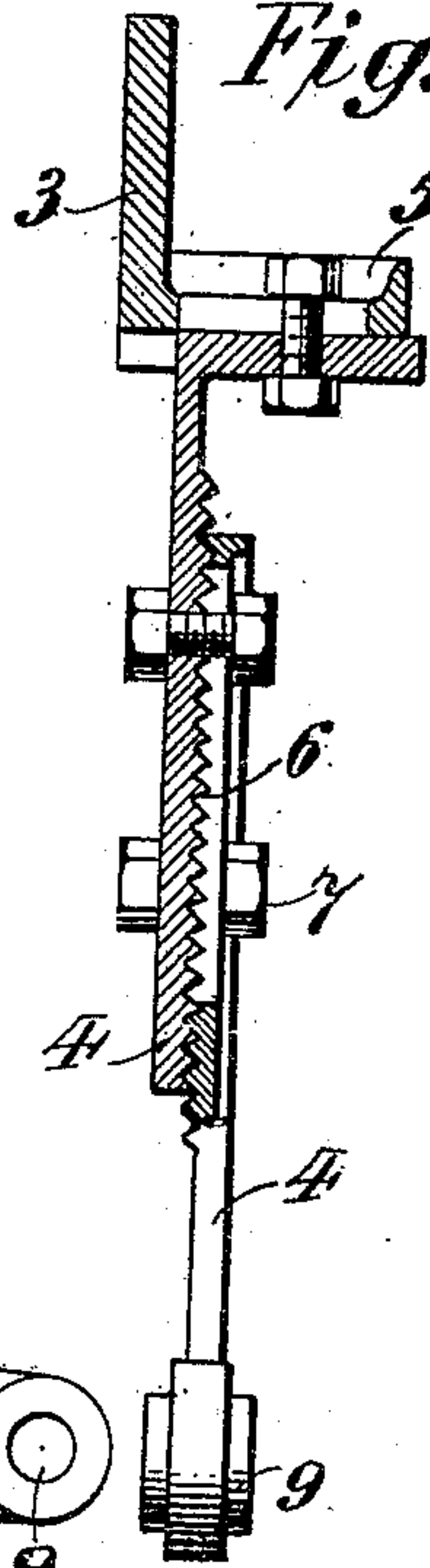
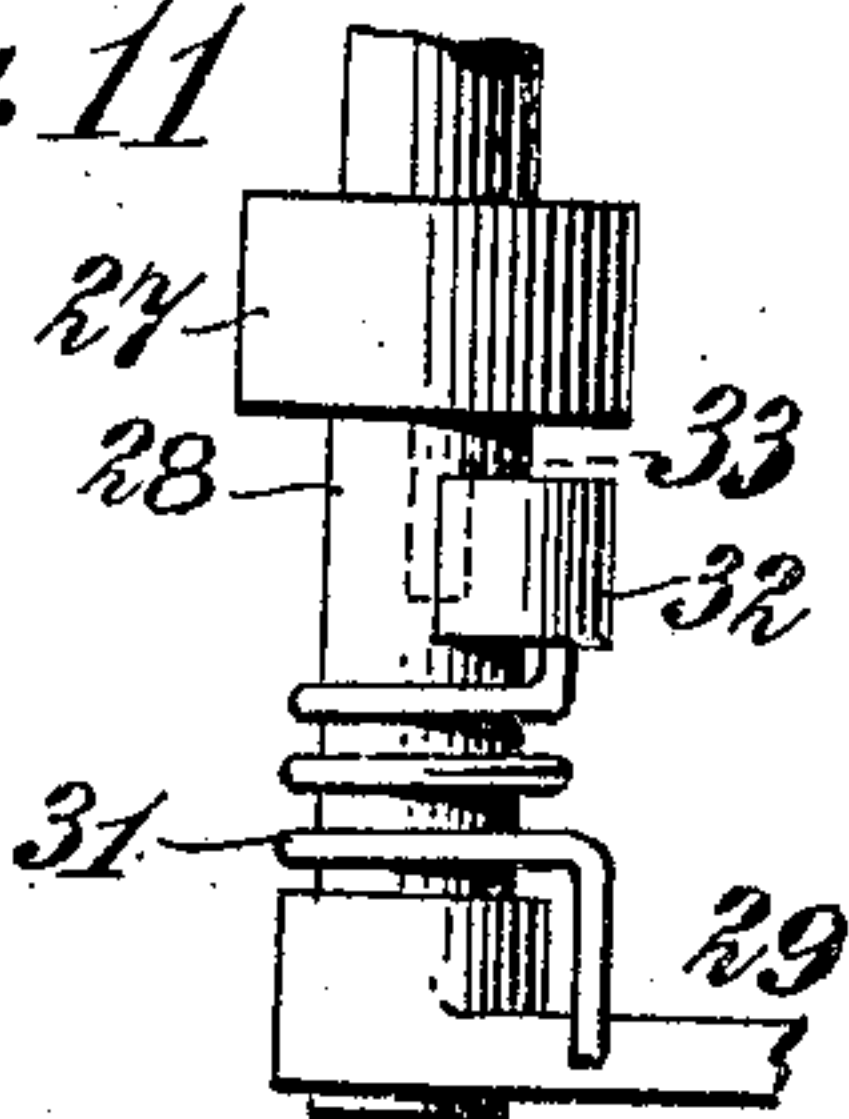


Fig. 11



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4 SHEETS—SHEET 4.

Fig. 8

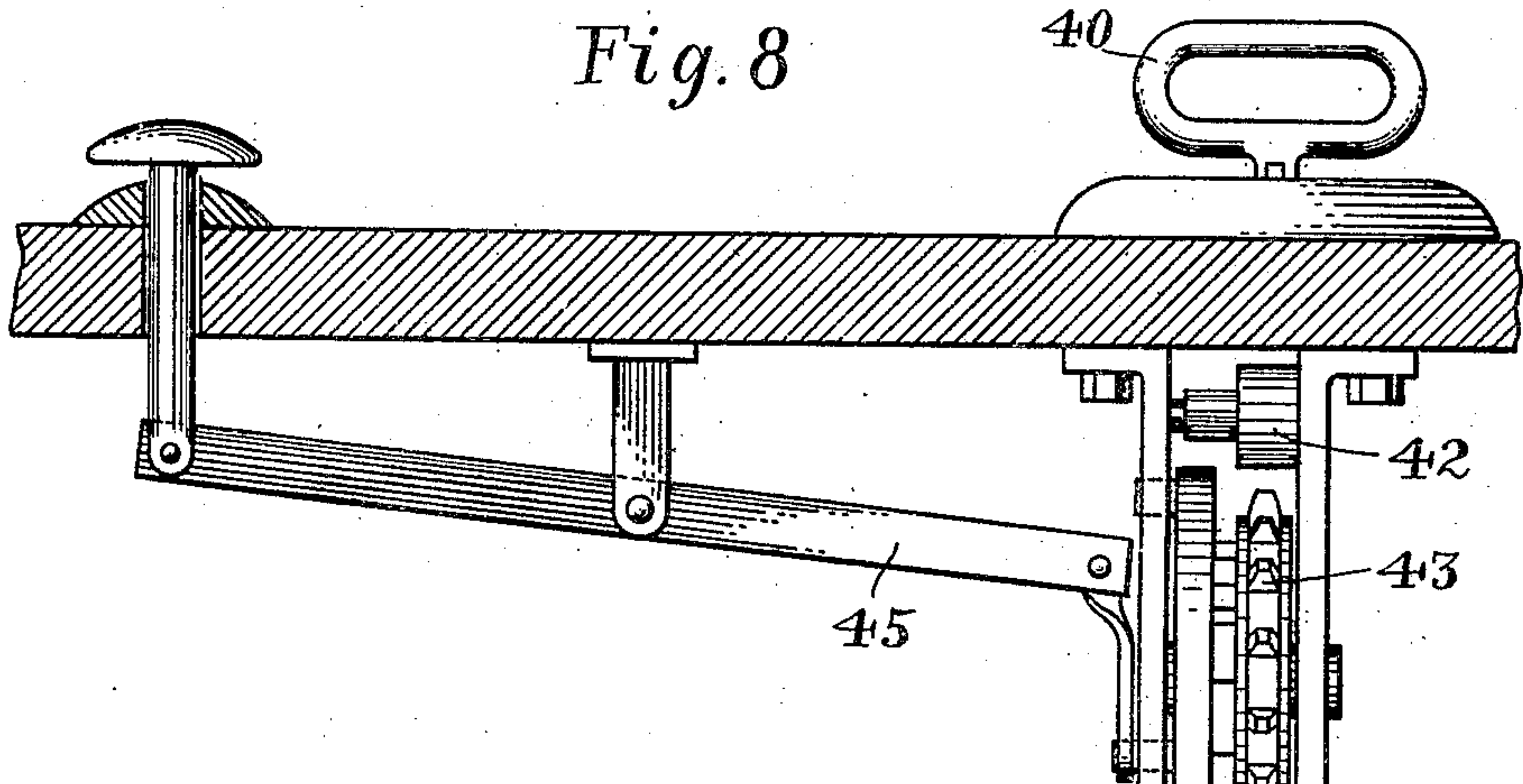


Fig. 9

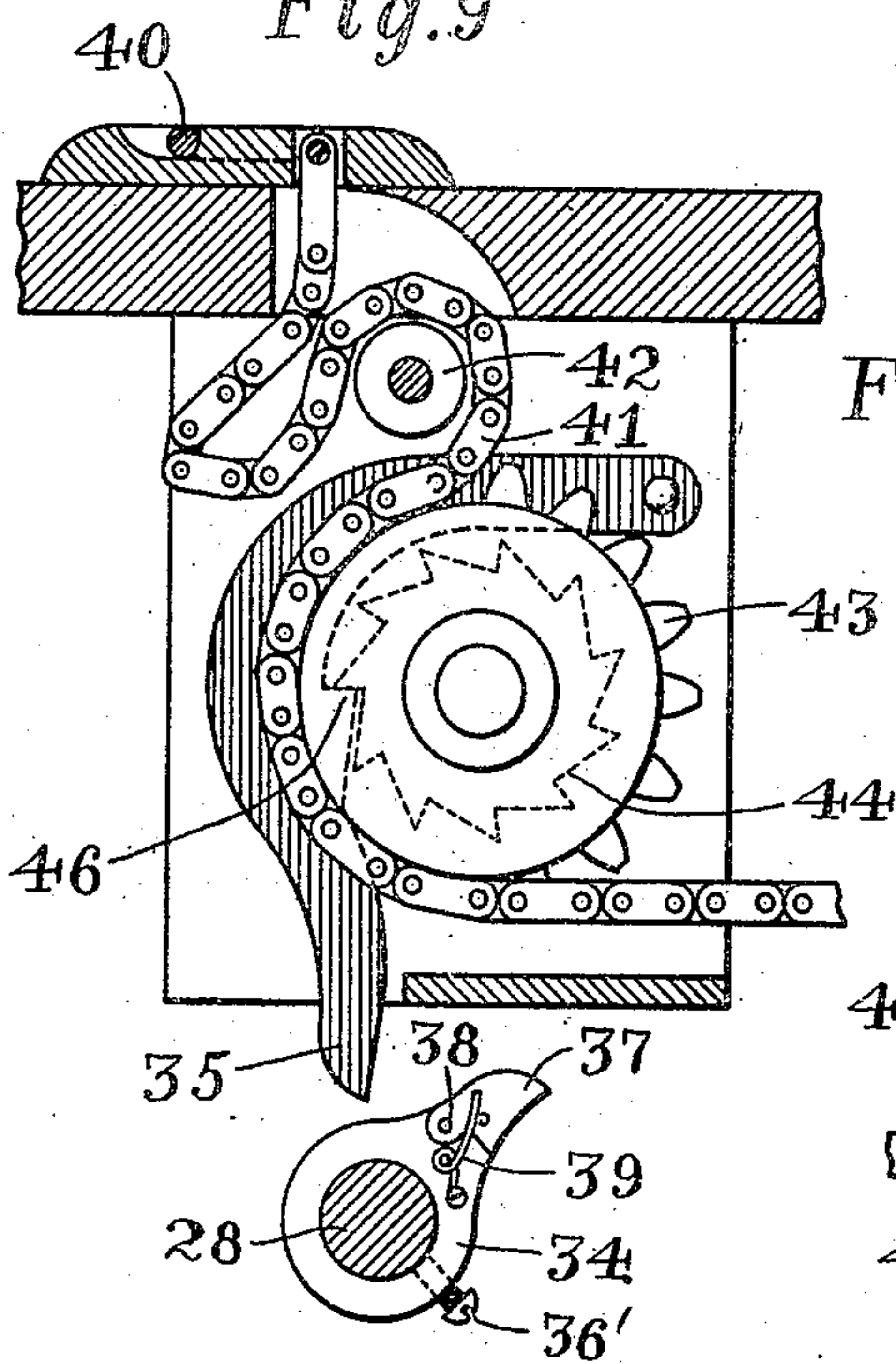
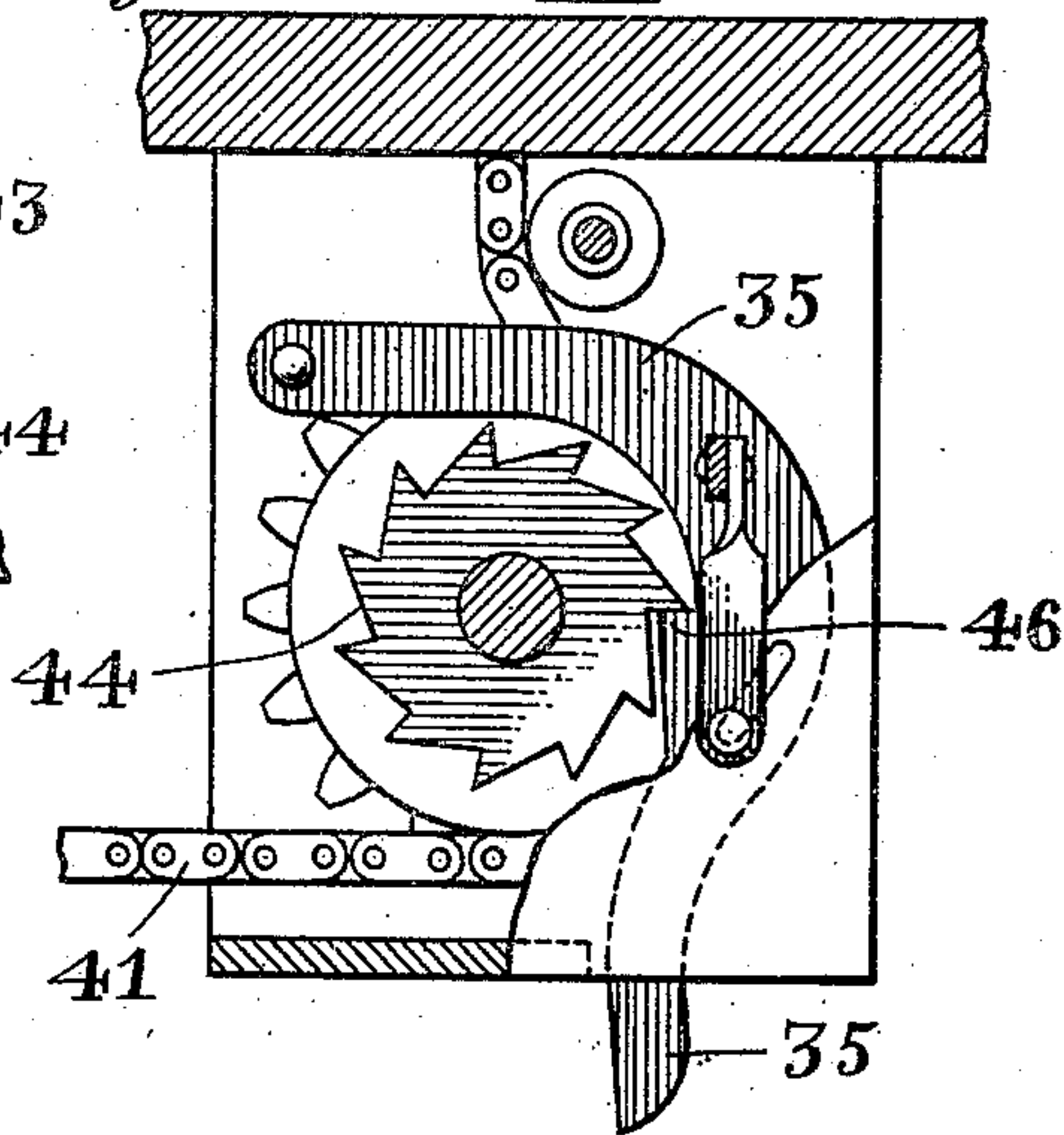


Fig. 10



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UNITED STATES PATENT OFFICE.

GEORGE HIPWOOD, OF LAKEPORT, NEW HAMPSHIRE, ASSIGNOR TO AMERICAN FENDER COMPANY, A CORPORATION OF ARIZONA TERRITORY.

FENDER.

946,966.

Specification of Letters Patent.

Patented Jan. 18, 1910.

Application filed August 10, 1908. Serial No. 447,573.

To all whom it may concern:

Be it known that I, GEORGE HIPWOOD, a citizen of the United States, and a resident of Lakeport, in the county of Belknap and State of New Hampshire, have invented certain new and useful Improvements in Fenders, of which the following is a specification.

My invention relates to fenders adapted for use on power propelled vehicles.

It relates to a fender located wholly underneath the car, capable of being operated either by the motorman or automatically by mechanism entirely outside the control of the employee.

It relates particularly to a fender provided with a light, but strong trip-guard, which brings about the drop of the fender before the object hit can come in contact with the fender proper.

To carry out my invention, I provide my fender with a guard normally held automatically in a vertical position, but capable of swinging freely in a horizontal plane. Moreover, the guard is displaceable longitudinally, and is provided with means for restoring it to its original position. These movements, by suitable intermediate mechanism and parts, operated thereby control absolutely and accurately the working of the fender and the successive steps in said action.

In the drawings: Figure 1 is a front elevation of the fender and its supports, a portion of the car platform being broken away, to show the lift and the motorman's trip; Fig. 2 is a cross-section of Fig. 1, on the line *a—a*, looking in the direction of the arrow; Fig. 3 is a top-view of the fender, a portion of the shoe and netting being broken away; Fig. 4 is a side view of the supporting brackets and vertical hangers; Fig. 5 is a partial vertical section through Fig. 4, showing the adjustability of the hangers; Fig. 6 shows a side view of the guard-hanger slot, a cross-section through the supporting bar, together with the lug attached to the hanger and the spring-controlled half-sleeve integral with the bar; Fig. 7 is a detail view showing the spring mechanism controlling the catch which supports the guard out of reach of obstacles when not in use; Fig. 8 shows an end view of the fender lift, with the foot-trip, the dog, and the cam operated by the

swinging guard; Fig. 9 is a side view of the lift mechanism, showing details of the trip mechanism, including details of the guard cam; Fig. 10 is a view of a portion of the trip mechanism, taken from the side opposite to that of Fig. 9; and Fig. 11 shows details of the guard-controlling mechanism, and the means by which the guard bar is displaced and restored to its original position.

Referring to the drawings: 1 is the car body, to the sills 2 of which are attached the supporting brackets 3 and the slotted vertical hangers 4. The brackets 3 are provided with slots 5, allowing the fender to be adjusted to cars of varying width, and the vertical hangers, on their abutting faces have notched surfaces 6, by means of which and the bolts 7, the hangers can be adapted to cars of different height. These fender supporting-members are placed as near as convenient to the running gear, that is, to the trucks, in order to be subject to the minimum amount of vertical oscillation. In the lower member of the hangers 4 are two bearings 8 and 9, in the former of which sits the rod 10, to which is attached the lift lever 11, carrying at its lower extremity the trip-cam 12, which acting against the set-out 13 on the fender frame 14, controls the operation of the fender proper. This fender frame is supported in the forward bearings 9 of the hanger 4, and is under control of the springs 15, one of whose ends is fast in the hanger 4 and the other is held under tension by the frame 14.

Through perforations 16 in the frame 14 extend the rods 17, so controlled by the springs 18 as to yield under pressure in the direction of their length, thereby giving a yielding resilient action to the shoe 19, whose frame 20 is axially supported by the yielding rods 17. A movement of the shoe vertically takes place by rotation of its axis 21 controlled by the tense springs 22 and 22¹, one end of the springs being fast to the rods 17, and the other end pressing against the under side of the shoe upwardly, as shown in dotted lines at 22¹. The shoe 19, of strong, light material, is preferably made in one piece, and to facilitate its passage over the surface of the track, it is provided with a series of rollers 23, preferably with a curved outline.

At the ends of the fender shoe 19 are pro-

vided, integral with the shoe, a pair of wheel-guards 24, which are given such a shape as to roll the person or obstacle, hit by the shoe outward and away from the track of the wheels.

To the forward end of the car sills 2 is suspended a most important feature of my fender, namely, the automatic trip-guard or apron 25. This guard may be made of a variety of materials, the form I prefer (shown in Fig. 1) is composed of stout metal wire bent on itself, the doubled-over ends forming convenient bearings. The bearings of the guard rest in vertical slots 26 (Fig. 6), fashioned in the hangers 27. These are loosely supported by the rod 28, journaled in brackets 29 attached to the car sills 2. The bar 28 carries two springs 30 and 31, whose function is to restore to its normal position the guard 25, when it is swung out of the vertical. This automatic return of the guard to the vertical, after displacement, is attained by the arrangement clearly shown in Fig. 7. The spring 30 or 31 is fastened at its one end to the bracket 29, and at its other end to the half-sleeve 32 integral with the bar 28. When the guard 25 swings backward in its slotted bearing 26, a lug 33 attached to the hanger 27, meets the half-sleeve 32, thereby putting the springs 30 and 31 under tension, the relief of which tension swings the guard again to the vertical position. Carried by the bar 28 is the eccentric cam 34, which contacting with the dog 35 brings about the dropping of the fender. The bar 28 is displaceable lengthwise in its bearings, for the purpose of allowing the cam 34 to swing clear of the dog 35, so as not to drop the fender, when the guard is swung upward under the car out of operative position. When the guard is not in use, that is, when it is at the rear end of the car, to prevent tampering with it and dropping the fender, it is displaced lengthwise sufficiently for the cam to clear the dog 35, and swung backward up onto the spring-controlled guard-catches 36, which engage each with a portion of the guard 25. The double spring 37¹, or two single springs, allow the catches 36 to yield against one spring upwardly to receive the guard 25. After the passage of the guard, the catch springs back to its horizontal position, and supports the guard until it needs to be put in use again, when a downward pull clears it of the catch, and the resiliency of the springs 30 and 31, acting longitudinally, brings the cam 34 back in front of the dog 35. A screw 36¹, or equivalent means, renders the cam adjustable on the bar 28, and hence governs the angle through which it is desirable the guard should swing before dropping the fender. The cam 34 is provided with a head

piece 37 pivoted at 38, and held in position by the spring 39. This pivoted head piece allows the cam to easily pass over the dog 35 when the guard returns to the vertical after having tripped the dog.

On the platform of the car, at the feet of the motorman, is placed, practically flush with the platform, the fender lift and under the platform is the housing for the trip mechanism, in which 40 is a handle attached to the sprocket chain 41. The chain passing over the guide roll 42, engages with and partially encircles the sprocket wheel 43, whence it passes to the upper end of the lift lever 11, at whose extremity is the cam 12, controlling the position of the fender frame 14. Attached to the same axis as the sprocket wheel 43 is the toothed wheel 44 engaged by the dog 35, which is actuated either by the motorman through the lever 45, or automatically by the guard-cam 34. It is evident that, to make the drop of the fender entirely automatic, it is only necessary to disconnect the lever 45 from the dog 35, when the swing of the guard alone will bring about the result.

The operation of the fender and its accessories is as follows:—Lifting the handle 40 causes the chain 41 to tilt on its axis the lever 11, whose cam 12 acting on the set-out 13 of the feeder frame 14, puts the fender in the up-position shown in full lines in Fig. 2. This operation sets the springs 15 under tension, ready when occasion offers, to assist gravity in bringing the fender down on the track, into the position indicated by the dotted lines in Fig. 2. The chain 41 before reaching the lever 11 passes about the sprocket wheel 43, and the operation of pulling forward the lever rotates over the dog-pawl 46, the ratchet-wheel 44, thus setting the pawl and wheel into intermeshed relation (shown in Figs. 9 and 10), ready to be tripped either by the motorman's foot-lever 45, or automatically by the guard-cam 34. Assume now the fender to be raised to the height above the track at which it is regularly carried; it is evident that pressure upon the foot lever 45 will release the dog-pawl from the ratchet-wheel 44, when gravity, assisted by the spring 15, will bring the fender speedily down upon the track. If through accident, oversight or other cause, the motorman neglects to work the lever 45, and an obstacle, human or other, comes in contact with the guard 25, this latter swinging with its supports 27 backward, causes, by means of the lug and half-sleeve 32, the supporting bar 28 to rotate on its bearings, thereby bringing the cam 34 into contact with the dog 35, disconnecting ratchet 44 and pawl 46, and dropping the fender to the dotted position of Fig. 2. If it is a person who has caused the dropping of the fender,

he first comes in contact with the shoe 19. The shoe, owing to its spring-controlled mountings yields in two directions, vertically, under the springs 22 and 22¹, and horizontally in the direction of the blow, under springs 18 on the frame rod 17. The result is, that instead of a severe blow being delivered, the yielding shoe deposits the person, with the minimum amount of damage, or none at all, into the back part of the fender net, where he is received by and held in the resilient wire bed. In practice, the receiving portion of the fender net would be given a more decided curve than is shown in the drawing. As mentioned above, the wheel-guards integral with the shoe, push the person beyond the track of the wheels, in case he falls at or near the end of the fender. The distance apart of the members of the guard should be so proportioned that no portion of a person's anatomy can pass between the adjacent members. If the guard 25 were not adjustable vertically, and the car should be stopped at such a point that the lower ends of the guard rested upon the person's body, then backing the car off from over the body might drive the ends of the guard into the person and inflict serious injury. But the guard yielding automatically vertically, in the slots 26, and being made of light material, no injury would be done to the person under the guard, if the car were backed. When the direction of the car is reversed, so that the guard is down at the rear end, serving no useful purpose, it is advisable to lift the guard up and hold it out of reach of those mischievously inclined. For this purpose, the supporting bar 28 is made longitudinally displaceable in its bearings 29. When this displacement is sufficient to allow the cam 34 to clear the dog 35, the guard is swung up under the car against the upwardly and downwardly yielding spring-controlled catches, where it is securely held until pulled down against the tension of the upwardly acting portion of the spring 37¹. The guard being released, the spring restores the guard catches 36 to their normal position.

Having thus fully described and illustrated my invention, what I claim, is:

1. In a fender, the combination of drop mechanism, a dog controlling said drop mechanism, a cam operating the dog, a horizontal guard-supporting bar displaceable longitudinally, and means for automatically returning the bar to its original position when displaced.

2. In a fender, the combination of a normally vertical guard, means for maintaining the guard in a vertical position, a supporting bar for said guard displaceable longitudinally, spring controlled catches for engaging and holding the guard when swung up under the car, and means for restoring the guard bar to its normal position when released from the catches, substantially as set forth.

3. The combination with fender lifting and holding mechanism, of a lever pivoted in the fender hangers and provided with a cam engaging the fender-frame, means for releasing the lifting mechanism, and a spring controlling the position of the fender-frame, substantially as set forth.

4. In a fender, the combination of a lifting chain, a toothed-wheel engaging said chain, a ratchet-wheel mounted axially with said toothed wheel, a dog engaging with the ratchet-wheel, a cam lever controlling the fender frame, springs acting on the fender frame against said cam lever, and means for releasing the dog from engagement with the ratchet-wheel.

5. The combination with the trip mechanism of a fender guard formed of light wire material bent back upon itself to form rectangular members open on the short sides, the extremities of the doubled-over wire forming hangers for the guard, substantially as set forth.

Signed at New York in the county of New York and State of New York this 27th day of July A. D. 1908.

GEORGE HIPWOOD.

Witnesses:

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D. N. HURLBUT.